Perspective on Vietnam and Petrovietnam's development strategies for biofuels production and distribution

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Vietnam's Development Scheme

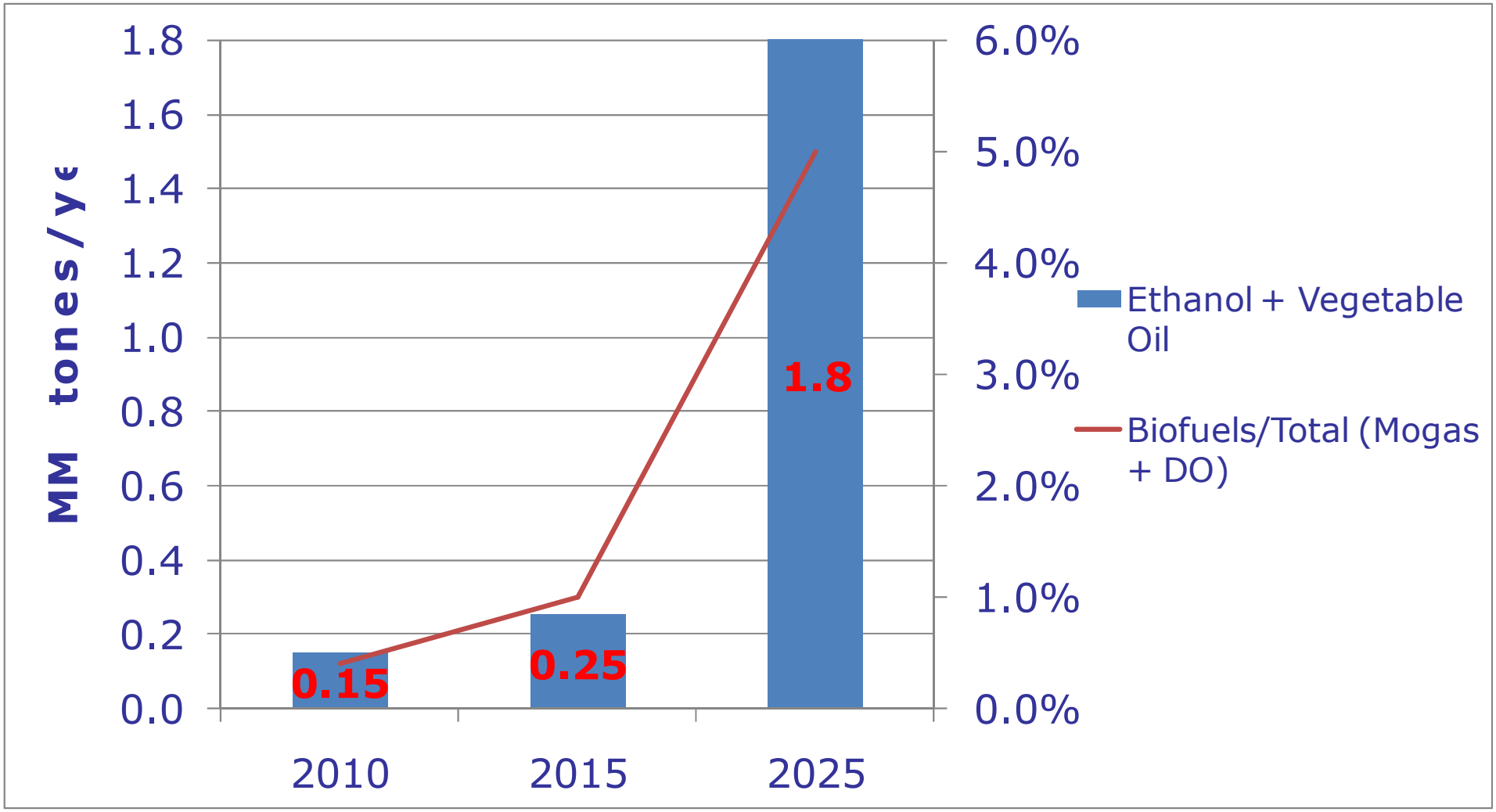
Government's Biofuel Policies

- Decision No. 177/2007/QD-TTg approving the scheme on development of biofuels up to 2015, with a vision to 2025: Nov. 20, 2007;
- Decision No. 1855/2007/QD-TTg approving Vietnam's national energy development strategy up to 2020, with a vision toward 2050: Dec. 27, 2007;
- TCVN 7716:2007 for Denatured ethanol standard: similar to ASTM D4806;
- TCVN 7717:2007 for B100 standard: similar to ASTM D6751;
- Decision No. 1842/QD-BNN-LN approving the program of research, development and usage of jatropha curcas in Vietnam in the period of 2008-2015 and vision till 2025: June 19, 2008;
- TCVN 8063:2009 for E5 standard;
- TCVN 8064:2009 for B5 standard.

Development Scheme – General Objectives

To develop biofuel, a new and renewable energy, for use as an alternative to partially replace conventional fossil fuels, contributing to assuring energy security and environmental protection.

Development Scheme – Specific Objectives



Development Scheme – Main Tasks

1. Conducting scientific research and technological development (R&D), deploying trial production of products to serve biofuel development:

- Mechanisms, policies and legal documents;
- Technology for blending E5 and B5;
- Technology for producing ethanol from various biomass sources;
- Production of Biodiesel from vegetable oil and animal fat;
- Plan and development of raw material areas;
- Additives and chemicals.

Development Scheme – Main Tasks

2. Founding and developing the biofuel production industry:
   - Investment encouragement, technical and technological advances application;
   - Biofuel production industry formation and development.
3. Building biofuel development potential:
   - Human resources training;
   - Material and technical foundations building and machinery and equipment modernizing.
4. International cooperation:
   - Proactive receiving, mastering and transferring technical and technological advances;
   - Implementation of 20 international cooperation projects.

Development Scheme – Major Solutions

1. Stepping up the application of research results to practical production;
2. Promoting technology transfer;
3. Creating an investment environment favorable for the development of biofuel production;
4. Increasing investment and diversifying funding sources;
5. Intensifying the building of material and technical foundations and training of human resources;

Development Scheme – Major Solutions

6. Perfecting the system of mechanisms, policies and legal documents for biofuel development:
   - Investment preferences, tax incentives;
   - Institutional biofuel standards based on G7 countries' standards;
   - Investment attraction, talented personnel encouragement to participate in R&D;
   - Hybridization of new microorganism species and industrial plant varieties;
   - Intellectual property enforcement.
7. Expanding and promoting international cooperation on study of biofuel development experience;

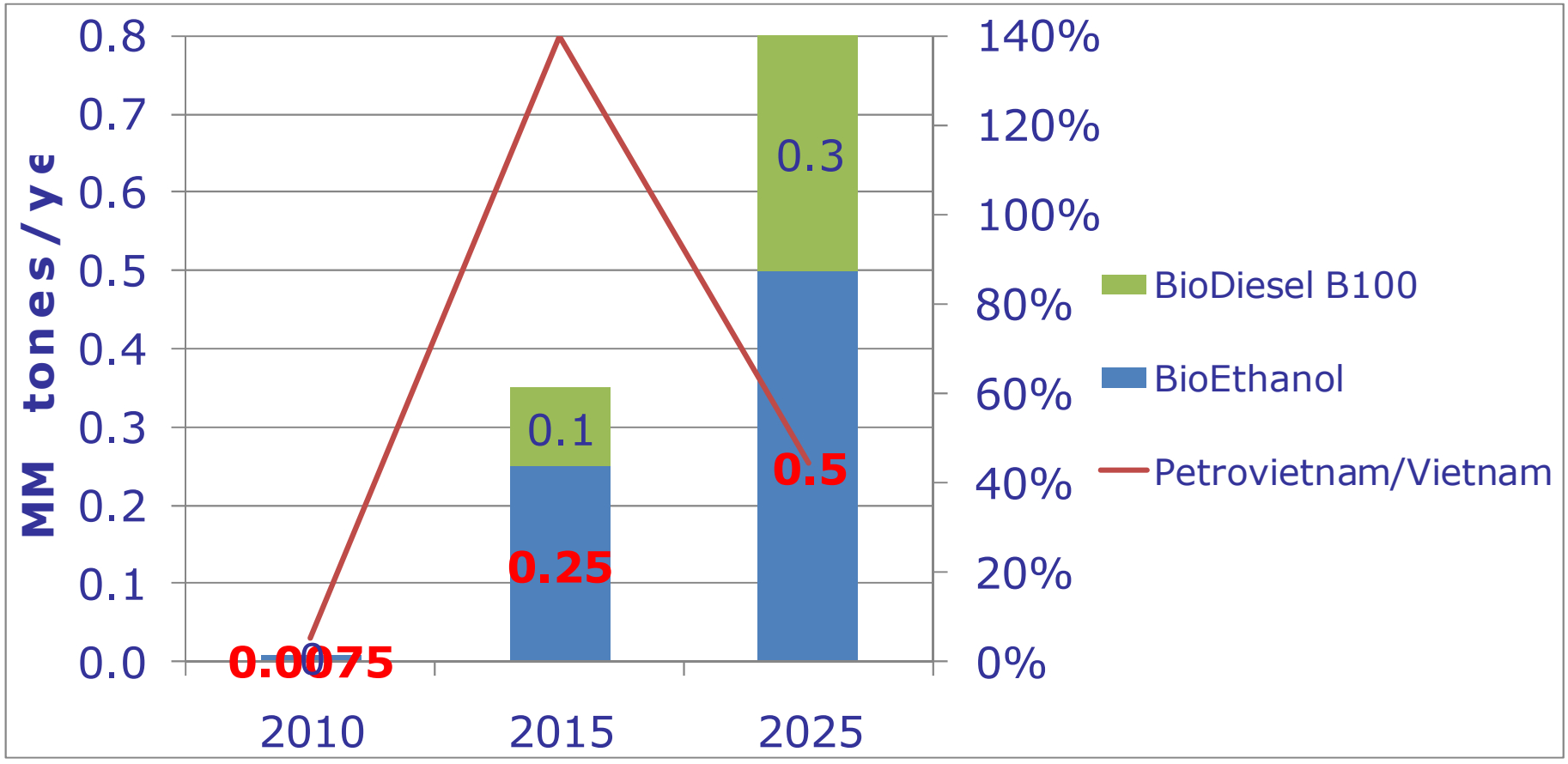
Development Scheme – Major Solutions

- In 2007-2015, investment in biofuel production: specially-encouraged sector.

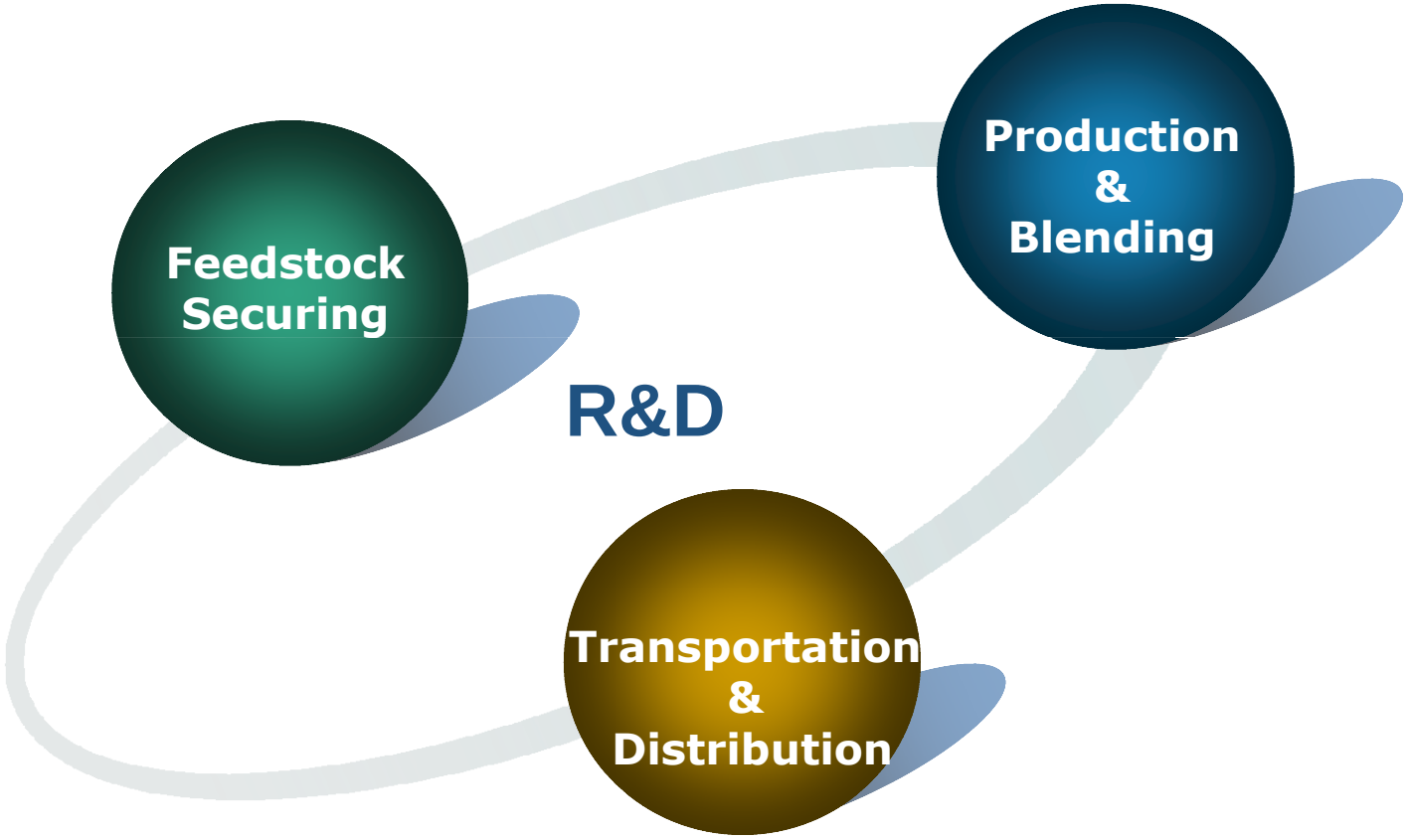
Case	Conditions	Preferential Tax Rate		Exemption and Reduction Periods	
		Tax Rate	Application Period	Exemption	50% Reduction
1	Manufacturing enterprise	Not applicable		2 Years	2 Years
2	Enterprise which moves out of a city in line with Master Plan approved by relevant authorities				
3	Encouraged Sector	20%	10 Years from commencement of operation	2 Years	3 Years (2 Years)
4	Encouraged Location (Service Enterprise in IZ)			2 Years	6 Years (2 Years)
5	Encouraged Sector + Encouraged Location (Manufacturing Enterprise in IZ)	15%	12 Years from commencement of operation	3 Years (2 Years)	7 Years (5 Years)
6	Specially-Encouraged Sector	10%	15 Years from commencement of operation	4 Years (2 Years)	9 Years (5 Years)
7	Specially-Encouraged Sector + Having Significant Economic Social Impact (Subject to Prime Minister Decision)	10%	Whole Project Period	4 Years	9 Years
8	Specially-Encouraged Location (Project in High-Tech Z)	10%	15 Years from commencement of operation	4 Years (2 Years)	9 Years (5 Years)

Petrovietnam's Development Plan

Petrovietnam's Objectives



Petrovietnam's Plan



Petrovietnam's Feedstock Securing Plan

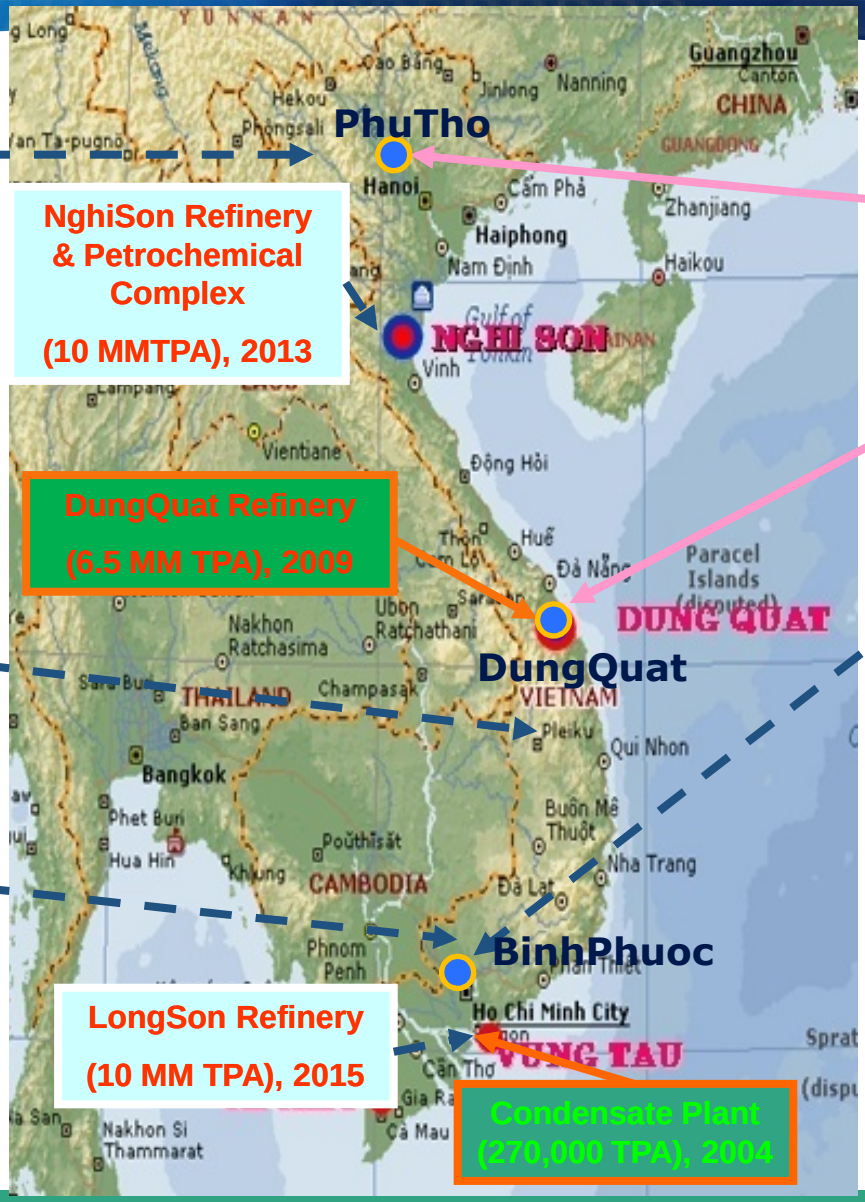
No.	Type of Feedstock	2015 (ha)	2025 (ha)
1	Cassava	120,000	240,000
2	Sugarcane	15,000	30,000
3	Jatropha	50,000	150,000
Total		**185,000**	**420,000**

Petrovietnam's Biofuel Production Plan

Northern Biodiesel Plant : 100-150 ML/year

Central Biodiesel Plant : 100 ML/year

Southern Biodiesel Plant : 100 ML/year



Northern Ethanol Plant : 100-200 ML/year

Central Ethanol Plant : 100-200 ML/year

Southern Ethanol Plant : 100-200 ML/year

In operation Plant

Project Under Construction

Investment Preparation Project

Petrovietnam's Biofuel Storage & Distribution Plan

No.	Period	Storage System (Tonnes)	Distribution System (# of blending & distributing terminals)
1	To 2010	15,000	10
2	2011-2015	40,000	50
3	2016-2025	80,000	100
Total		**135,000**	**160**

Petrovietnam's R&D Plan – E5

- Application of E5: reported to MOIT to promulgate E5 standard for Vietnam

No.	Task	Status
1	Lab tests (blending formula, engine AVL test)	Done
2	Blending at industry facility	Done
3	Off-road tests (2 cars in 4 months)	Done
4	On-road test (4 cars in 2 months)	Done
5	Tank storage test (2 months)	Done
6	Autotest (2 trucks, 6 months)	Done
7	Large scale on-road test	Done
8	Inspecting transportation and distribution system	Conducting
9	Large scale distribution	Conducting

Petrovietnam's R&D Plan – B5

❖ Application of B5: following TCVN 8064:2009

No.	Task	Status
1	Lab tests (blending formula, engine AVL test)	Preparing
2	Blending at industry facility	Preparing
3	Off-road tests	Skipped
4	On-road test	Skipped
5	Storage test	Preparing
6	Autotest	Skipped
7	Large scale on-road test	Preparing
8	Planting and harvesting Jatropha Curcas	Preparing
9	Producing B100 from various feedstocks	Conducting

Petrovietnam's R&D Plan – 2nd & 3rd Biofuel Generation

- 2nd generation of Biofuel using biomass:
  - Feedstock: select and formulate plans to develop, collect and transport;
  - Production technologies: experiment biomass-to-ethanol fermentation and biorefinery (gasification, fast pyrolysis, Fisher-Tropsch) technologies.
- 3rd generation of Biofuel using algea:
  - Feedstock: type selection, planting & cultivating procedures;
  - Production technology: algea-to-ethanol and microalgea-to-biodiesel technologies.

Conclusions

1. Vietnamese government has established clear roadmap and policies to apply and develop biofuels in Vietnam;
2. Petrovietnam intends to become the largest producer and distributor of biofuels in Vietnam;
3. Large R&D efforts are required to realize Vietnam and Petrovietnam's objectives.

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Thank you for your attentions !

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